



**Former Weapons Storage Area  
Plattsburgh Air Force Base  
Plattsburgh, New York**

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**FINAL  
NFRAP DECISION DOCUMENT  
(for Radiological Waste Investigation)**



**Contract No. F41624-03-D-8601**

**Task Order No. 0017**

**Revision 0.0**

**September 2004**

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**FPM** group

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**NFRAP DECISION DOCUMENT  
(For Radiological Waste Investigation)**

**Prepared for:**

**Former Weapons Storage Area  
Plattsburgh Air Force Base  
Plattsburgh, New York**

**Through**

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**Contract No. F41624-03-D-8601  
Task Order 0017**

**September 2004**

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## **SITE NAME and LOCATION**

This Decision Document is being issued by United States (U.S.) Air Force to document the No Further Action recommendation contained within the Radiological Waste Preliminary Assessment and Site Inspection (PA/SI) conducted at specific locations within the former Weapons Storage Area facilities (WSA) (hereafter the defined areas within the boundary fence of the former WSA will be referred to as "areas"), Plattsburgh Air Force Base (AFB), New York.

## **STATEMENT of BASIS**

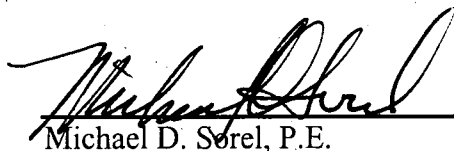
This decision is based on the results of a PA/SI for radiological waste conducted at several locations within the former WSA site, Plattsburgh AFB.

## **DESCRIPTION of the SELECTED REMEDY**

The PA/SI recommended the remedy of No Further Response Action Planned (NFRAP). No residual radioactivity of concern was identified in any of the buildings or areas surveyed as part of the PA/SI, therefore the areas do not appear to pose an unacceptable risk to human health or the environment. The United States Environmental Protection Agency (USEPA) accepted the Draft-Final PA/SI report with no comments. The New York State Department of Environmental Conservation (NYSDEC) agreed with the conclusions and recommendations of the PA/SI that no further actions are necessary from a radiological perspective for the surface soils or building interiors of the WSA.

## **STATUTORY DETERMINATIONS**

This decision document presents the selected no further action planned for the radiological investigation areas within the former WSA site, Plattsburgh, New York, which was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and reauthorizing Act of 1986 (SARA), and the National Contingency Plan (NCP). It also satisfies the requirements of the National Environmental Policy Act that applies to CERCLA response actions. It has been determined that the selected remedy of NFRAP is protective of human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate, and is cost-effective. Radiological levels at the areas have been determined to present no significant threat to human health or the environment.



Michael D. Sorel, P.E.

Site Manager/BRAC Environmental Coordinator  
Air Force Real Property Agency/DA-Plattsburgh

9-22-04

Date



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## **1.0 INTRODUCTION**

This Decision Document is being issued by United States (U.S.) Air Force to document the No Further Action recommendation contained within the Radiological Waste Preliminary Assessment and Site Inspection (PA/SI) conducted at specific locations within the former Weapons Storage Area facilities (WSA) (hereafter the defined areas within the boundary fence of the former WSA will be referred to as "areas"), Plattsburgh Air Force Base (AFB), New York. The NFRAP recommendation is supported by the following information.

### **1.1 Site Summary**

Plattsburgh AFB is located in Clinton County, along the western shore of Lake Champlain and consisted of 3,447 acres prior to its closure. The former installation is located in a mixed-use area consisting of private residences and industrial and commercial enterprises. It is bordered by the City of Plattsburgh and the Saranac River to the north, and the Salmon River to the south (Figure 1-1). Lake Champlain and lakeshore communities within the Town of Plattsburgh lie to the east and southeast.

The installation can be viewed as being divided into two areas based on historic land use. The "Old Base" also known as the Barracks, encompassing approximately 250 acres of land with administrative, warehouse, maintenance and housing buildings. The "New Base" portion supports an airfield, aviation related and other industrial buildings (including the WSA).

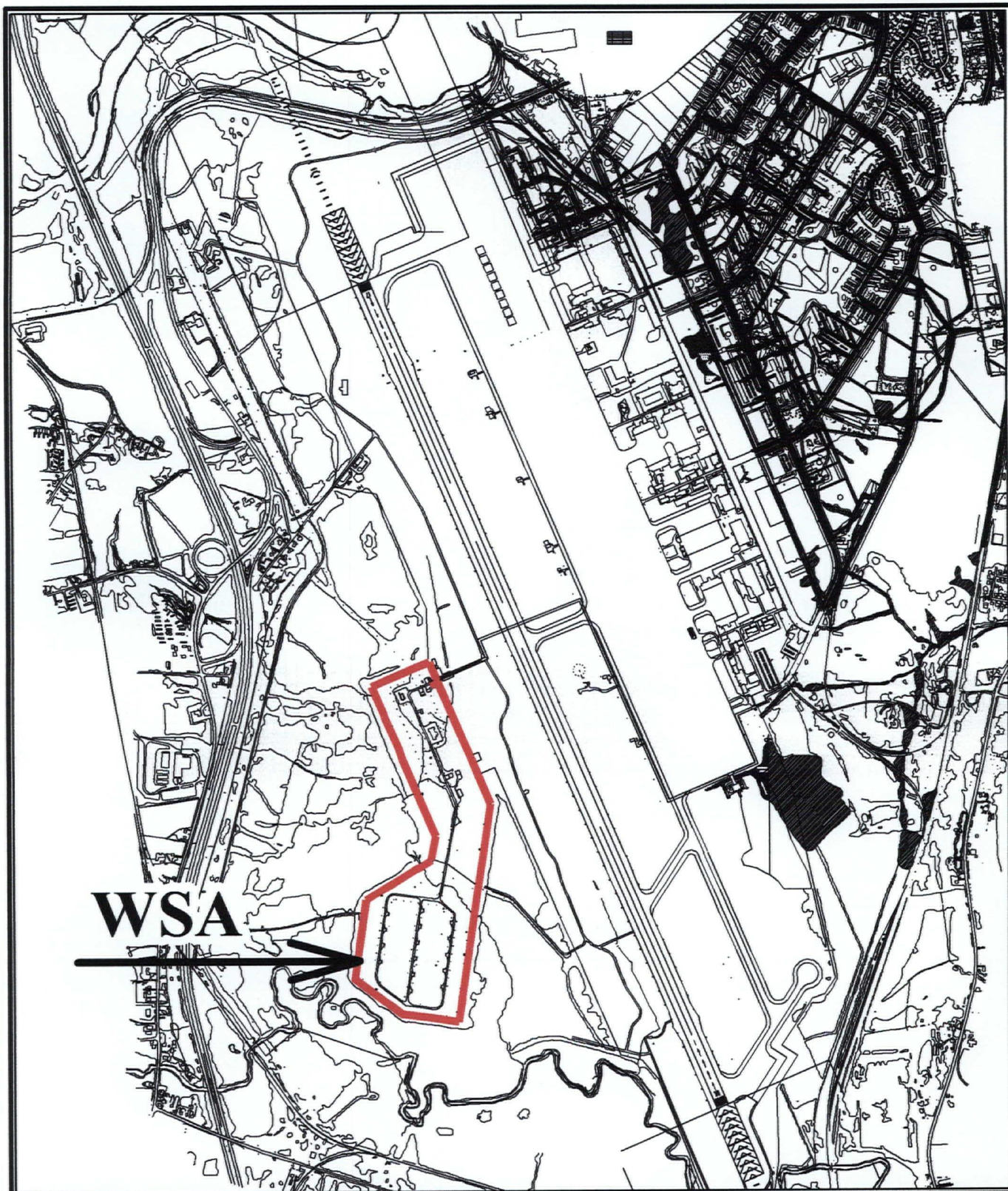
### **1.2 Geology**

The surficial unconsolidated deposits in the region consist of sand, silt, and clay that form an unconfined aquifer overlying glacial till. Sand and gravel deposits occur along the Salmon and Saranac Rivers. These include fine- to coarse-grained sand interbedded with layers of gravel. The underlying glacial till consists of sandy till and clayey till forming a continuous confining or semi-confining layer that extends across the base. Limestone and dolomite with interbedded layers of sandstone and shale form the bedrock underlying the confining layer.

### **1.3 Hydrology**

Regional groundwater flow within the unconsolidated aquifer is generally east towards Lake Champlain; however it is also influenced by the Salmon River. A north-south groundwater divide approximately bisects the apron. Groundwater flow above this ridge, is southwest towards the Salmon River while groundwater flow on the eastern side is toward Lake Champlain.





**WSA**



**Site Location Map**

**UNITED STATES AIR FORCE  
PLATTSBURG AIR FORCE BASE  
PLATTSBURG, NEW YORK**



**FPM** group

**Figure 1.1**



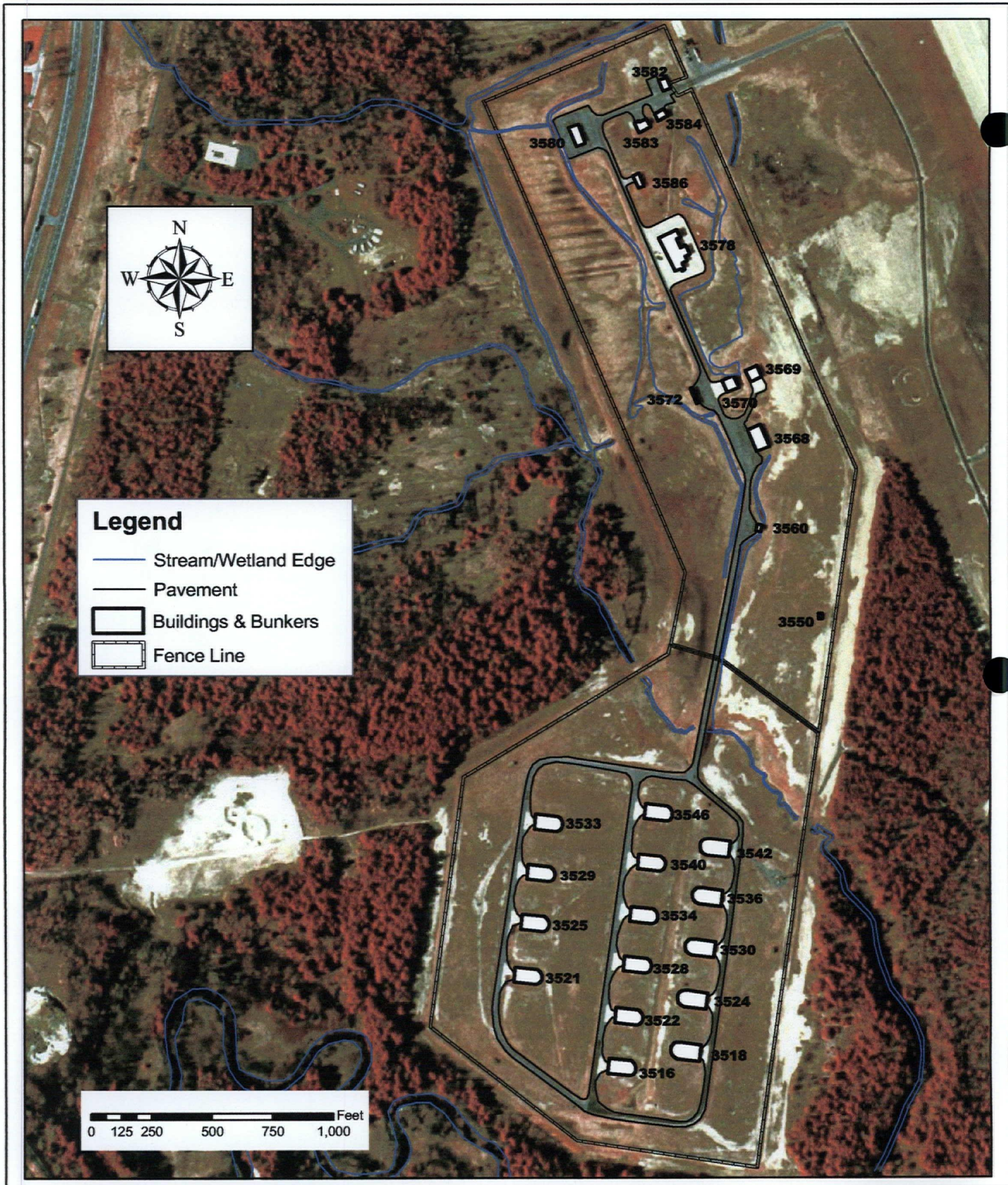
## 2.0 SITE DESCRIPTION

The Plattsburgh AFB former WSA covers approximately 100 acres west of the airfield. This was a secured area enclosed by an 8-foot-high chain-link fence topped with barbed wire which was used for storage and maintenance of various types of munitions and weapon component systems (e.g., conventional and nuclear missiles and bombs). The layout of the former WSA is shown in Figure 2-1 and is described in detail below. Facilities constructed with the WSA included earth-covered storage bunkers (or igloos), other munitions storage buildings, maintenance buildings, and administrative and security buildings. In the southern portion of the WSA, there are 15 earth-covered bunkers (Figure 2-1) 13 of which are identical made from reinforced concrete and covered with soil (Buildings 3518, 3521, 3522, 3524, 3525, 3528, 3529, 3530, 3533, 3534, 3536, 3540 and 3546). The bunkers have an open floor and curved walls that form an arch cover (2,404 sq ft). The concrete roof is covered with approximately two feet of soil. Entrance to the bunkers is provided via two large steel doors attached in front of a concrete apron that connects to an access road. The other two bunkers, Buildings 3516 (1,611 sq ft) and 3542 (1,302 sq ft) are similar in design, but have different interiors. These bunkers were designed to house the components of early nuclear weapons. Within these buildings vaults were constructed to house the nuclear components.

The design of certain weapons systems stored in the WSA required maintenance activities that resulted in the generation of residual radioactive contamination. These weapons consisted of two components: a capsule that contained the fissionable material, and the remainder of the weapon that included the shell, fin assemblies, electronics, batteries, radar antennae, fusing system, parachute, explosives and a chamber ("pit" lined with depleted uranium) into which the capsule was inserted. Inspection and maintenance of the non-capsule components was required periodically and included inspection and testing of electronics, replacement of batteries, inspection and replacement of mechanical components, and inspection and cleaning of the pit. The pits were inspected visually for defects or corrosion. Because the inside surface of the pit was lined with DU, uranium oxide would form on the surface creating small chips or flakes (referred to as spallation) which would have to be cleaned and removed. The oxide was removed using wipes and trichloroethylene (TCE). Waste generated during these maintenance activities would include the wipes with residual material, gloves, booties, other protective clothing, and paper used to cover the work area. Cleaning of the capsules was also done periodically using TCE wipes. Waste was generally collected in small metal containers about the size of a 5 to 10-gallon buckets.

Weapons maintenance wastes are known to have been buried in the ground within the WSAs at some Air Force installations, including burial in shallow disposal trenches and inside metal or concrete pipes buried vertically in the ground. However, Air Force technical orders in place during the time these types of weapons were being maintained (i.e., the late 1950s and early 1960s) authorized not only the burial of solid radioactive waste, but also the burial of such waste at sea. Burial at sea involved transferring the waste over to the U.S. Navy for disposal at designated sites in the Atlantic and Pacific oceans. Interviews with former weapons maintenance technicians indicate that





	Plattsburgh AFB WSA	Date: 2-10-04 Project #: 03-6001.08	Figure 2-1
	Weapons Storage and Maintenance Building Area	File Name: WSA Prepared By: JTM	



### **3.0 PRELIMINARY ASSESSMENT**

#### **3.1 Plattsburgh AFB WSA Radiological Decommissioning Survey, June 1995**

In June 1995, the Air Force's Armstrong Laboratory, Health Physics Branch (AL/OEBZ) performed a radiological decommissioning survey in Air Force WSA buildings. AL/OEBZ has since become the AFIOH Environmental Radiation Branch (AFIOH/SDRE). The survey was reported in a September 1995 memorandum from AL/OEBZ to the Plattsburgh AFB Bioenvironmental Engineering office. Site-specific historical information regarding any accidents/incidents involving nuclear weapons within the WSA was sought. Information obtained indicated that no accidents or incidents had ever occurred at the Plattsburgh AFB WSA. The memorandum stated that it is "highly unlikely that an incident of sufficient magnitude to release radioactive material could have occurred without being detected." The recommendation, based on the results of the decommissioning survey, was that all facilities surveyed were considered releasable for public use, based on Nuclear Regulatory Commission (NRC) Regulatory Guide 1.86 limits of 20 disintegrations per minute per hundred centimeters squared (dpm/100 cm<sup>2</sup>) for alpha contamination and 1,000 dpm/100 cm<sup>2</sup> for beta/gamma contamination.

The survey was performed inside all of the storage bunkers (Buildings 3516, 3518, 3522, 3524, 3525, 3528, 3529, 3530, 3533, 3534, 3536, 3540, 3542 and 3546) and Building 3578. One field instrument for the detection of low-energy radiation measurement on the floor in the north maintenance bay in Building 3578 indicated radiation levels higher than background. A wipe and concrete sample collected at that location identified only naturally-occurring isotopes, which are common in construction materials. One wipe sample on the floor in Building 3525 reported results above background, but well below the Regulatory Guide 1.86 limits. Five additional wipes were collected in this area of Building 3525 and sent to Armstrong Laboratory for analysis. The results for these wipe samples were below the detection limit of the laboratory instruments. All other measurements performed during the survey were at ambient background levels.

#### **3.2 Plattsburgh AFB WSA Preliminary Radiological Assessment Survey, June 2003**

AFIOH/SDRE performed a preliminary radiological assessment survey of the Plattsburgh AFB WSA in June 2003. The survey concentrated on areas that had the highest potential for radiological impact with respect to potential for exposure of members of the public. The specific areas of interest included Building 3578, Buildings 3516 and 3542 (capsule storage bunkers), and Building 3525, the storage bunker where an elevated wipe sample was reported during the 1995 AL/OEBZ survey. The objective of the survey was to verify that the identified structures and their surrounding areas did not pose an immediate radiological risk to the public.



The radionuclides of potential concern for the survey were uranium and its associated decay products. Interior surveys included direct measurements for gamma activity at biased locations using a FIDLER, wipe samples collected at biased locations for removable alpha activity, and exposure rates at biased locations using a Ludlum Model 19 MicroR Meter. Exterior surveys included gamma scans and direct measurements of surface soil using a FIDLER, exposure rates using a Ludlum Model 19 MicroR Meter, and surface soil samples (i.e., first six inches of soil). Surface water samples were also collected.

Based on the survey, AFIOH concluded that results from the reference area measurements were within the same range as the interior and exterior measurements and that there was not an immediate health risk from suspected residual radioactive materials associated with former WSA maintenance operations in all high interest interior and exterior areas. The report also recommended that a PA/SI be performed to assess any long-term impacts associated with previous weapons maintenance activities and make a determination whether unrestricted use of the WSA was still appropriate.

### **3.3 Site Visit, June 2003**

On June 26, 2003, Cabrera Services, Inc. (Cabrera) visited the former Plattsburgh AFB to review historical documents related to the project and visually inspect the former WSA. The purpose of the visit was to collect information to support the design of the SI. Cabrera inspected Building 3578, the former M&I building, and the 15 storage bunkers and walked over the site to determine which areas were more likely to be used for potential disposal of maintenance waste. Special attention was paid to the area surrounding Building 3578 and the capsule storage bunkers (Buildings 3516 and 3542). Cabrera also reviewed historical documents concerning the former WSA, paying special attention to blueprints and "as built" drawings.



#### 4.0 RADIONUCLIDES OF POTENTIAL CONCERN

Radionuclides that could be present at Plattsburgh AFB as a result of the weapons maintenance activities that occurred in the late 1950s and early 1960s include:

- Highly enriched uranium: HEU may have been the fissionable material used and would have been contained in the capsule portion of the weapons.
- Depleted uranium: DU was a component of the pit where the capsule was inserted. The inside of the pit was unsealed, which means there was direct contact with the DU on the inside of the pit.

DU and HEU are the only contaminants of potential concern for the PA/SI. Plutonium (Pu) was a potential component of the weapons, but was sealed using cladding to prevent oxidation. The clad Pu was placed inside an environmentally controlled container to further isolate the Pu from the environment. The Pu cladding was wipe tested to ensure integrity. If wipe results came back positive (i.e., Pu contamination was identified), the Pu was immediately contained and shipped offsite. No Pu was ever detected during wipe testing. Therefore, Pu is not considered a contaminant of potential concern for the PA/SI.

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## 5.0 SITE INSPECTION

The primary objectives of this SI were to verify the adequacy of data collected during previous radiological investigations, and perform a Preliminary Risk Evaluation (PRE) for the Plattsburgh AFB WSA. The field program was implemented to identify subsurface anomalies that may indicate the presence of former disposal areas, and collect sufficient radiological data on building surfaces and surface soils. Historical investigations indicate that potential radiological contamination is limited to uranium isotopes (i.e., U-234, U-235, and U-238), and their short-lived decay progeny.

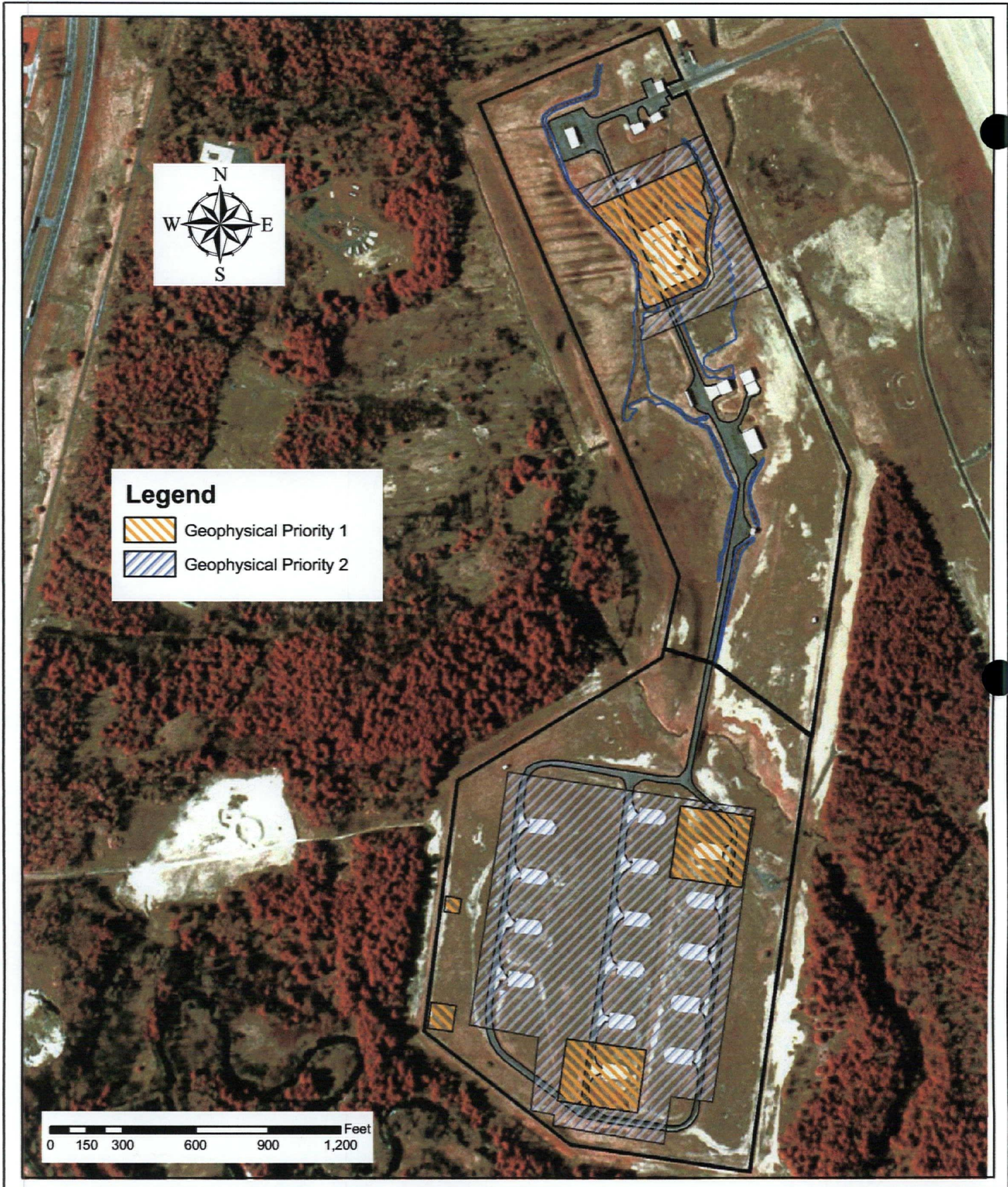
The measurements performed during the SI consisted of a combination of on-site direct radiation measurements using hand-held radiation detectors and non-intrusive geophysical techniques to investigate the subsurface. On-site radiological measurement techniques were selected based on radiological characteristics of the uranium contaminant, potentially impacted media, and reasonable implementation of the best available technology. Geophysical techniques were selected based on the type of waste expected in the potential burial trenches (i.e., gloves, booties, wipes, paper, and DU residue from maintenance activities) and potential disposal practices (e.g., buried metal containers, covered slit trenches). Based on the results of the on-site radiation measurements and the geophysical measurements, several biased surface soil samples and a small number of biased concrete samples were collected to provide additional information on uranium concentrations.

### 5.1 Geophysical Investigation

Geophysical investigations were designed to map subsurface anomalies that could indicate the presence of potential burial or disposal locations. The areas of primary interest for geophysical surveys were the area around Building 3578, and the area surrounding each capsule bunker (Buildings 3516 and 3542). These areas are shown as Priority 1 areas (Figure 5-1) and are where the burial of the waste materials generated by weapons maintenance would most likely have occurred. Of secondary interest were areas further away from Building 3578 and the remaining bunkers, indicated as Priority 2 areas. The potential burial areas were described by Air Force personnel as approximately 2 meters (m) wide by 4 m long by 2 to 3 m deep (e.g., small trenches).

Electromagnetic (EM) profiling has traditionally been used in mineral exploration for tracing conductive ore bodies, like massive sulfides. EM surveys have also been widely used in environmental applications for mapping buried objects, for delineating the edges of disposal areas and "hotspots" within those areas, and tracing leachate contaminant plumes in groundwater. An EM survey measures the electrical conductivity of a subsurface volume, which is a function of the soil or rock type, porosity/permeability, and fluid content. Measurements of conductivity are obtained through electromagnetic induction and do not require direct ground contact.





	Plattsburgh AFB WSA	Date: 1-9-04 Project #: 03-5001.06	Figure 5-1
	Building 3578 & Weapons Storage Area	File Name: Geophysical Priority Areas Prepared By: JTM	



An EM profiling survey was conducted between October 3 and October 16, 2003 covering more than 37 acres (7.8 in the area surrounding the Building 3578 and 29.6 in the WSA bunker area). Data was collected at more than 90,000 locations. Priority 1 areas were completed with a traverse separation of 5 feet, while priority 2 areas were surveyed with a traverse separation of 10 feet in accordance to the field sampling plan (FSP).

EM profiling investigations identified eleven geophysical anomalies near Building 3578 and three anomalies in the WSA bunker area that could not be readily explained. Anomalies 3578-7, -8, -19, -20, -21, -22, -23A, -25, -27, -28, and -29 near Building 3578 and WSA-34, WSA-35, and WSA-37 (Figures 5-2 and 5-3) were further investigated with Ground Penetrating Radar (GPR). GPR data has indicated that:

- Anomalies 3578-7 and -8 located southwest of Building 3578 are strong reflectors one to three feet across and one to one and one-half feet deep. These may be buried structures associated with the buried adjacent utilities and do not fit the profile of a small disposal trench.
- Anomaly 3578-19 is located east of Building 3578. It has no known source but is less than three feet across, and is thus does not fit the profile of a small disposal trench.
- Anomaly 3578-20 is located just east of the edge of the concrete apron around Building 3578. This is a strong reflector one to two feet across and 2.5 feet deep and does not fit the profile of a small disposal trench.
- Anomaly 3578-21 is a concrete pad approximately 5 feet long and 3 feet wide and, although it did not exhibit a large EM anomaly, it was surveyed because its function was not understood. The results did not indicate buried material beneath the pad.
- Anomaly 3578-22 is located 15 feet east of the concrete apron around Building 3578 and is a somewhat irregular depression. The GPR results did not fit the profile of a small disposal trench, and the depression is suspected to have occurred during a soil removal action.
- Anomaly 3578-23A is located on the north side of Building 3578. The pad was expanded in 1960, it was possible that a disposal trench could have been dug prior to the pad extension. The GPR results did not fit the profile of a disposal trench.
- Anomalies 3578-25, -27, -28, and -29 were associated with a culvert east of the creek, a former septic tank, the piping for the septic tank, and a small access road culvert, respectively.
- Anomaly WSA-34 located north of Building 3542 indicated a shallow strong reflector, interpreted to be from a metallic object less than 0.5 foot deep. A soil sample was collected at the anomaly location. The sample confirmed the absence of radionuclides of concern.





	<p>Plattsburgh AFB WSA</p> <p>Geophysical Anomalies Building 3578</p>	<p>Date: 1-26-04 Project #: 03-5001.08 File Name: Geophysical Anomalies Prepared By: JTM</p>	<p><b>Figure 5-2</b></p>
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0 125 250 500 Feet



Plattsburch AFB WSA

Geophysical Anomalies  
Weapons Storage Area

Date: 1-26-04

Project #: 03-5001.08

File Name: Geophysical Anomalies

Prepared By: JTM

**Figure  
5-3**



- Anomaly WSA-35 located north of Building 3522 also indicated a shallow strong reflector, interpreted to be from a metallic object less than 0.5 foot deep. A soil sample was collected, however this sample also failed to identify the presence of the radionuclides of concern.
- Anomaly WSA-37 located southeast of Building 3516 indicated a small object approximately one foot deep. As with the two other WSA anomalies a soil sample was collected which failed to identify the presence of the radionuclide of concern.

Based on these findings it has been concluded that it is unlikely that depleted uranium wastes from the maintenance of large open pit weapons systems are disposed of within the boundaries of the former WSA.

## **5.2 Radiological Investigation**

The purpose of the radiological investigation was to confirm the results of the previous WSA Radiological Decommissioning Survey (1995). The PA/SI included a historical assessment and field activities that provided sufficient information to perform a Preliminary Risk Evaluation (PRE). The investigation took place between October 1 and November 2, 2003. Measurements were performed on interior building surfaces to confirm the previous results. Surface soil measurements were performed to collect information on radionuclide concentrations to support the PRE. Groundwater and surface water samples were collected and submitted to the AFIOH laboratory at Brooks City-Base in San Antonio, Texas for analysis of radiological parameters, also in support of the PRE. In addition, dose rate measurements were performed to provide additional information on radioactivity in the WSA.

### **5.2.1 Building Surface Scans and Gamma Walkover Survey**

Building surface scans were conducted for the walls, floors, and adjoining concrete aprons at Buildings 3524, 3516 and 3542 (results are shown in Section 4 of the PA/SI, [Cabrera, 2004]). A Gamma Walkover Survey was conducted for Building 3578 and the surrounding areas along with the former WSA Bunker area (results are shown in Section 4 of the PA/SI, [Cabrera, 2004]). Based on these results biased locations were identified for further investigation.

### **5.2.2 Interior Static Measurements**

Interior static measurements were taken at locations previously identified in Buildings 3524, 3516, and 3542.

- Building 3524 - Six static measurements were performed in Building 3524. None of the measurements exceeded the investigation level of twice the average count rate from the scan survey as specified in the field sampling plan (FSP) for the

PA/SI. The location with the highest alpha count rate based on the scan survey results was selected as the location for a concrete sample to be collected.

- Building 3516 - Eight static measurements were performed in Building 3516. None of the measurements exceeded the average count rate from the scan survey. Because of the elevated average count rate from the scan survey, four locations were identified as locations for concrete samples: the location of the highest alpha scan count rate and one additional location with a slightly elevated alpha count rate based on the scan survey in each of the three rooms.
- Building 3542 - Seven static measurements were performed in Building 3542. None of the measurements exceeded the investigation level of twice the average count rate from the scan survey specified in the FSP. The location with the highest alpha count rate based on the scan survey results was selected as the location for a concrete sample to be collected.

### 5.3 Concrete Samples

Nine concrete samples were collected and analyzed for isotopic uranium by alpha spectrometry. One biased sample was collected in each surveyed building at the location with the highest alpha count rate measured during the building surface scan survey. Three additional samples were collected inside Building 3516 to ensure that the elevated average alpha count rate measured during the building surface scan survey did not interfere with the ability to detect areas of elevated activity. One additional sample was collected in each of the three rooms in Building 3516. Finally, three reference building samples were collected from the floor inside Building 3560 (results are shown in Section 4 of the PA/SI, [Cabrera, 2004]).

The results of the concrete sample analysis indicate that there are no areas of elevated uranium activity. U-235 was not detected in any sample taken in the buildings or the reference area. U-238 and U-234 concentrations were approximately equal (i.e., reported measurement uncertainties for the analytical results overlap). This means there is no evidence of either depleted or enriched uranium in any of the samples. Only one sample reported concentrations greater than the average activity in the reference area (4CNC04, inner room of Building 3516). The uranium concentration in this sample is not significantly greater than the average reference area uranium concentration (i.e., the reported measurement uncertainty for the analytical result overlaps the average background concentration).

### 5.4 Surface Soil Samples

A total of 87 surface soil samples were collected and analyzed by gamma spectrometry and alpha spectrometry to estimate radionuclide concentrations in soil. In the bunker area, 15 locations were co-located with ISOCS measurements, 30 locations were selected at the two floor drainage outlets at each of the 15 bunkers, 3 locations were co-located with geophysical anomalies, and 5 locations in drainage paths and culverts were selected



based on professional judgment. Around Building 3578 24 locations were co-located with previous measurements. Ten surface soil sample locations were co-located with ISOCS measurements in the reference area.

The results of the surface soil sample analyses indicate there are few areas of elevated uranium activity. The average U-234 concentration in the bunker area was equal to the average concentration in the reference area, while the U-234 concentration around Building 3578 was slightly greater than the reference area. Seven samples in the bunker area and two samples around Building 3578 were significantly greater than the average reference area concentration for U-234 (i.e., the reported measurement uncertainty for the analytical results does not overlap the average reference area concentration for U-234), results are shown in Section 4 of the PA/SI, (Cabrera, 2004)

Only five samples reported U-235 activity above the detection limit. Two samples were from the reference area (4SSS06 and 4SSS07) and the remaining three were from the bunker area (4SSS20, 4SSS26, and 4SSS28 listed in Table 7). The average U-235 concentration in the bunker area was slightly higher than the average concentration in the reference area. The maximum U-235 concentration in the bunker area (0.050 pCi/g) was the same as the maximum U-235 concentration in the reference area. None of the U-235 results are significantly greater than the average U-235 concentration in the reference area (i.e., the reported measurement uncertainty overlaps the average U-235 concentration in the reference area).

## **5.5 Water Samples**

Seven groundwater samples and one surface water sample were collected and analyzed using gamma spectrometry and alpha spectrometry. No radionuclides were detected in any of these samples.

## **5.6 Gamma Dose Rate Measurements**

The gamma dose rate measurement results ranged from 2.0 to 5.0  $\mu\text{R/h}$ . No areas of elevated dose rates were identified.

## 6.0 PROTECTIVENESS

The surface soil samples were the only analysis that reported uranium concentrations greater than the reference area uranium concentrations. There were no elevated levels of uranium activity identified in the buildings, groundwater, or surface water. There were no indications of depleted or enriched uranium detected in any sample or measurement (results are shown in Section 4 of the PA/SI, [Cabrera, 2004]).

The Nuclear Regulatory Commission (NRC) published screening levels equivalent to 25 millirem per year (mrem/y) for radionuclides in soil (NRC 1999). The U.S. EPA published screening levels equivalent to a lifetime risk of cancer incidence of one in one million for radionuclides in soil (EPA 2000). Soil screening levels (SSLs) are used to identify areas requiring further investigation. The generic SSLs published by NRC and EPA are based on reasonably conservative assumptions that can generally be applied to any site. Comparing uranium concentrations measured in the collected surface soil samples with these published values will provide estimates of dose and risk for the site.

Table 6-1 lists the NRC and EPA SSLs for U-234, U-235, and U-238. The maximum concentration above background for each radionuclide is also listed. The maximum concentration above background was calculated by taking the maximum measured concentration for that radionuclide (see Section 4 of the PA/SI, [Cabrera, 2004]) and subtracting the average reference area concentration (see Section 4 of the PA/SI, [Cabrera, 2004]). The estimates of dose or risk for each radionuclide are calculated by dividing the maximum concentration above background by the SSL. The total dose or risk is calculated by summing the doses or risks from individual radionuclides. Using the maximum concentration above background and the generic SSL values provides a conservative estimate for dose and risk associated with current activities at the former Plattsburgh WSA.

The conservative estimate of dose is 1.5 mrem/y and the conservative estimate of risk is  $5.1 \times 10^{-7}$ . These low estimates of the maximum dose and risk associated with current use of the former WSA indicate that the cancer risk does not exceed threshold values where additional investigation would be necessary.

There was a small area of elevated Z-score identified by the gamma walkover survey immediately northeast of Building 3534 in the bunker area where no additional investigations were performed. The area is approximately 400 square feet in area and contains the highest count rate measured during the gamma walkover survey (see Section 4 of the PA/SI, [Cabrera, 2004]).

**Table 6-1**  
**Results of the Preliminary Risk Evaluation**

Nuclide	NRC SSL (pCi/g per 25 mrem/y)	EPA SSL (pCi/g per 1E- 06 Risk)	Max. Conc. Above Bkgd. (pCi/g)	Dose (mrem/y)	Risk of Cancer Incidence
U-234	13	5.02	0.43	0.83	8.6E-08
U-235	8.0	0.206	0.005	0.16	2.4E-08
U-238	14	0.979	0.39	0.70	4.0E-07
Total				1.5	5.1E-07

The area with the second highest count rate measured during the gamma walkover survey was investigated with surface soil sample 4SSS83. The results from this sample were consistent with the average results from the reference area samples. It is unlikely there could be levels of radioactivity present at the location northeast of Building 3534 that would result in a dose or risk greater than those estimated in Table 1.

The results and conclusions of the 1995 Air Force radiological survey of the buildings in the former WSA were confirmed by the results of the radiological investigation as no residual radioactivity was identified in any of the buildings surveyed as part of the PA/SI that was performed.

## 7.0 DESCRIPTION OF THE NFRAP ALTERNATIVE

This decision document presents the selected No Further Response Action Planned alternative for radiological waste at the former WSA at Plattsburgh AFB, in Plattsburgh, New York, which was chosen in accordance with CERCLA, as amended by SARA, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The USEPA and NYSDEC have reviewed the Draft Final PA/SI. The NYSDEC agreed with the conclusions and the recommendations of the PA/SI that no further actions are necessary from a radiological perspective for the surface soils or the building interiors of the WSA. The USEPA had no comments on the PA/SI. The PA/SI recommended the selected remedy (NFRAP) contained within this document. The PA/SI has determined that no long-term impacts are associated with the previous weapons maintenance activities and that the areas are acceptable for unrestricted use.

As this NFRAP document is a decision for "No Action," the statutory requirements of CERCLA Section 121 for remedial actions are not applicable and no five year review will be undertaken.

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## 8.0 REFERENCES

Cabrera Services Inc., *Preliminary Assessment and Site Inspection Report for the Former Weapons Storage Area, Plattsburgh Air Force Base*, February 2004.



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